Lecture 1 - Introduction

ECON 3070 - Intermediate Microeconomic Theory

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Why Study Microeconomics?

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People respond to incentives

People make decisions on the margin

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Trade-offs

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- How do you spend your (scarce) money?

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Incentives

- How will people respond to a gas tax? (rebound-effect)
- Why are B-cycles always broken? (tragedy of the commons)

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Incentives

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- Why are B-cycles always broken? (tragedy of the commons)

On the margin

- Do I watch one more episode or go to bed?
- How much pollution should we allow?

Analytical Tools

Any model requires us to specify which variables will taken as given and which will be determined by the model.

- An exogenous variable is a variable that is taken as given in the model.
- An endogenous variable is a variable that is determined by the model.

Analytical Tools

Try It Yourself

Suppose you create a model to tell you what your estimated grade will be, based on how much you study, and how much you sleep the night before.

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Suppose you create a model to tell you what your estimated grade will be, based on how much you study, and how much you sleep the night before.

- The amount of studying and amount of sleep are exogenous variables.
- Your estimated grade is an endogenous variable.

Analytical Tools

Try It Yourself

Suppose you create a model to tell you how much money you will earn after you graduate, depending on your college major and on the estimated unemployment rate on the day that you graduate.

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Suppose you create a model to tell you how much money you will earn after you graduate, depending on your college major and on the estimated unemployment rate on the day that you graduate.

- Your college major and unemployment rate are exogenous variables.
- Your post-graduate earnings are an endogenous variable.

Analytical Tools

Economic models: A formal description of a problem being addressed.

Examples:

- How the drought in California might affect the price of coffee in the United States.
- How an individual makes the decision of whether to attend college, vocational school, or neither.
- How a man or woman chooses their spouse/partner.

Three Tools of Microeconomic Analysis

Nearly all microeconomic models rely on just three key analytical tools:

1. Constrained optimization
2. Equilibrium analysis
3. Comparative statics

Throughout this course, we will use these three tools to analyze microeconomic problems.

Calculus Aside

This class is going to require you to do a lot of algebra and take a lot of partial derivatives. People in this class are coming in with different skill levels, which is okay!

The next lecture will be a calculus review and you'll review problems in your first recitation. So you will have time to practice. If you don't spend the time now remembering how to take them, it will be difficult to succeed in the course.

Constrained optimization

Constrained optimization is used when a decision maker seeks to make the optimal choice, taking into account any possible limitations or restrictions on choices

Example

An individual seeks to maximize, through their choice of Friday night activities, their happiness.

- An **objective function** is the relationship that the decision maker seeks to optimize (e.g. maximize their Friday night).
- The decision maker has to take into consideration their **constraints** (e.g. the individual only has $20 to spend).

Constrained Optimization

A farmer needs to build a rectangular fence for her sheep. She has F feet of fence, and is able to choose the dimensions (L and W) of her pen. Her goal is to maximize the area of the pen.

What is the objective function and what is the constraint?

Constrained Optimization

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What is the objective function and what is the constraint?

- The farmer's **objective function** is the function for the area of the pen, *L*W*.
- The farmer's **constraint** is that they only have *F* feet of fence.

Constrained Optimization

Try It Yourself

A baker has 8 hours in a day, during which he can bake cakes and brownies. If he bakes a cake, he can sell it for $10, and it will take him 2 hours. If he bakes a tray of brownies, he can sell it for $8, and it takes him 1 hour. However, the baker only has the supplies to bake at most 4 trays of brownies and 3 cakes in a given day.

How many brownies and cakes should the baker bake?

Marginal Reasoning and Constrained Optimization

Continuing our example of the baker maximizing their profit. Suppose the baker is currently baking 3 cakes and 2 trays of brownies. Their profit is $46.

What would his profit be if he instead baked 2 cakes, and 4 trays of brownies?

- He would gain $16 from the two additional brownie trays and lose $8 for the cake.
- The additional profit gained, $8 reflects the *marginal* impact of the decision.

Margin = “Of Another”

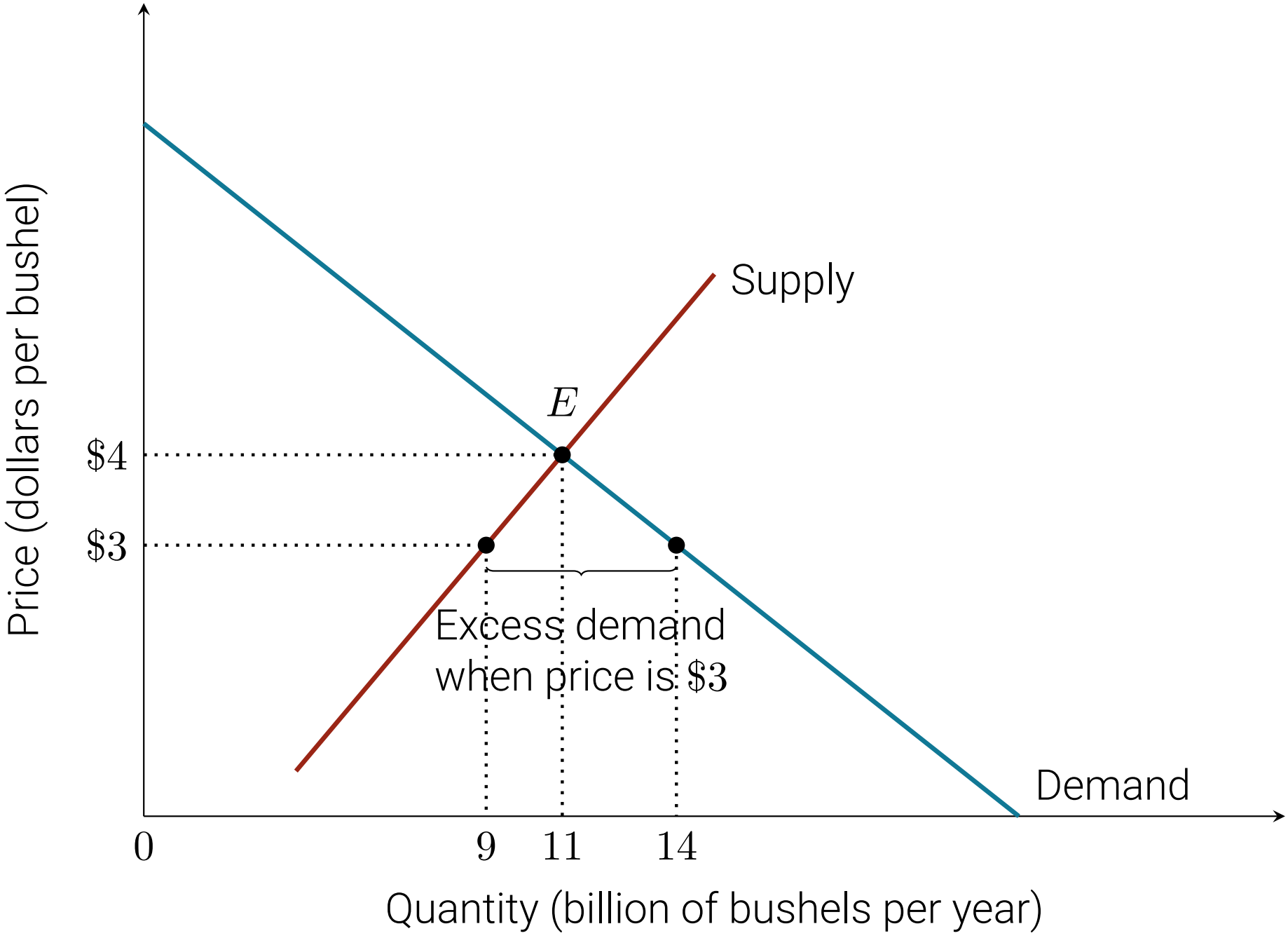
In economics, you will *always* hear the world ‘marginal’. When you hear it, you can always replace it with the phrase ‘of another’

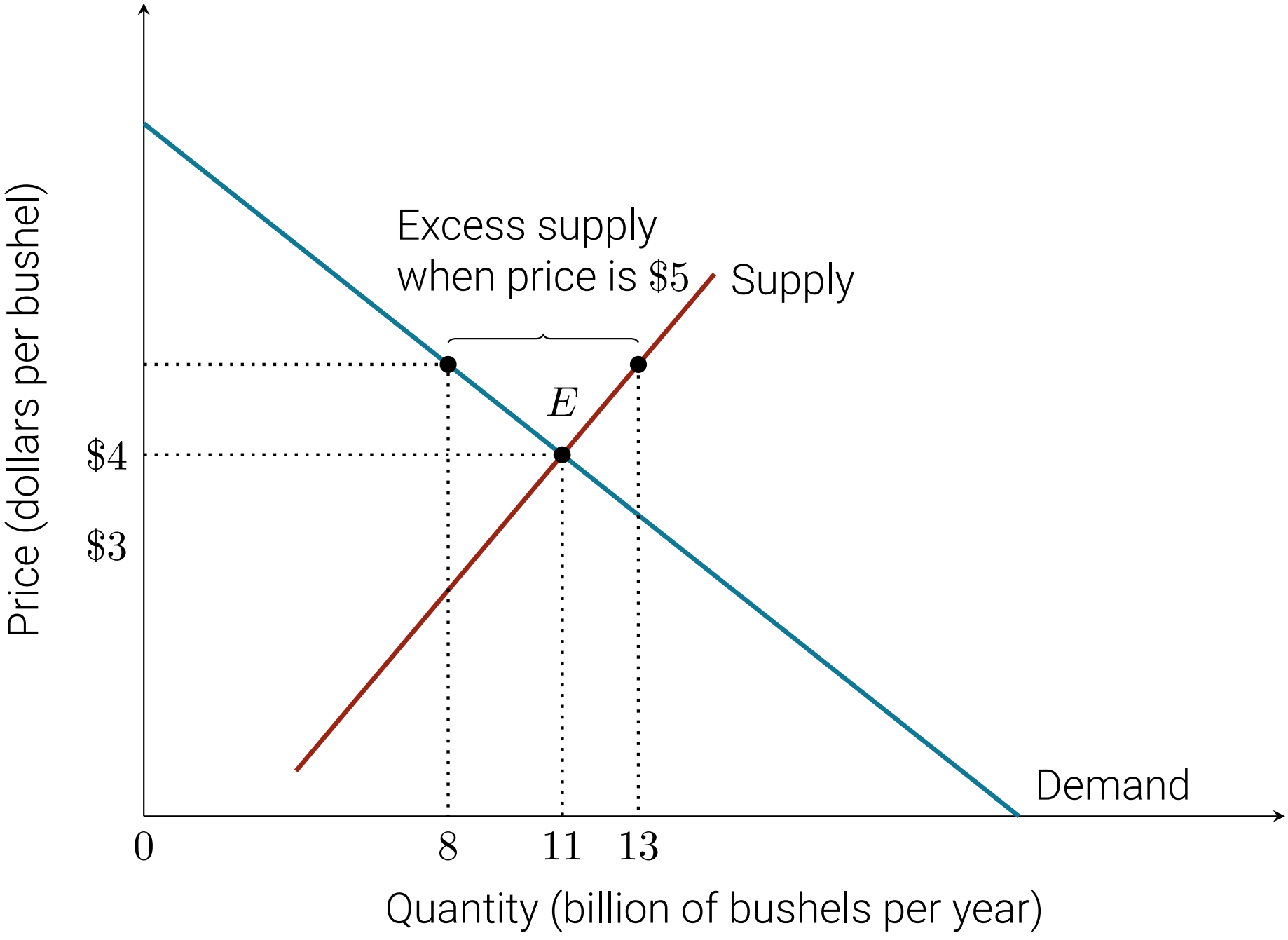
- So for example, if I say “what is the marginal benefit of studying?”, I mean “what is the benefit of studying another hour?”

Equilibrium Analysis

An **equilibrium** in a system is a state or condition that will continue indefinitely as long as exogenous factors remain unchanged.

In a competitive market, equilibrium occurs when the price is such that the quantity supplied by producers is equal to the quantity demanded by consumers.


Price (dollars per bushel)
Supply
E
$4
$3
Excess demand
when price is $3
Demand
0
9
11
14
Quantity (billion of bushels per year)


Price (dollars per bushel)
Excess supply
when price is $5
Supply
E
$4
$3
Demand
0
8
11
13
Quantity (billion of bushels per year)

Comparative Statics

Comparative statics analysis is used to examine how a shock to a system will affect another variable in an economic model.

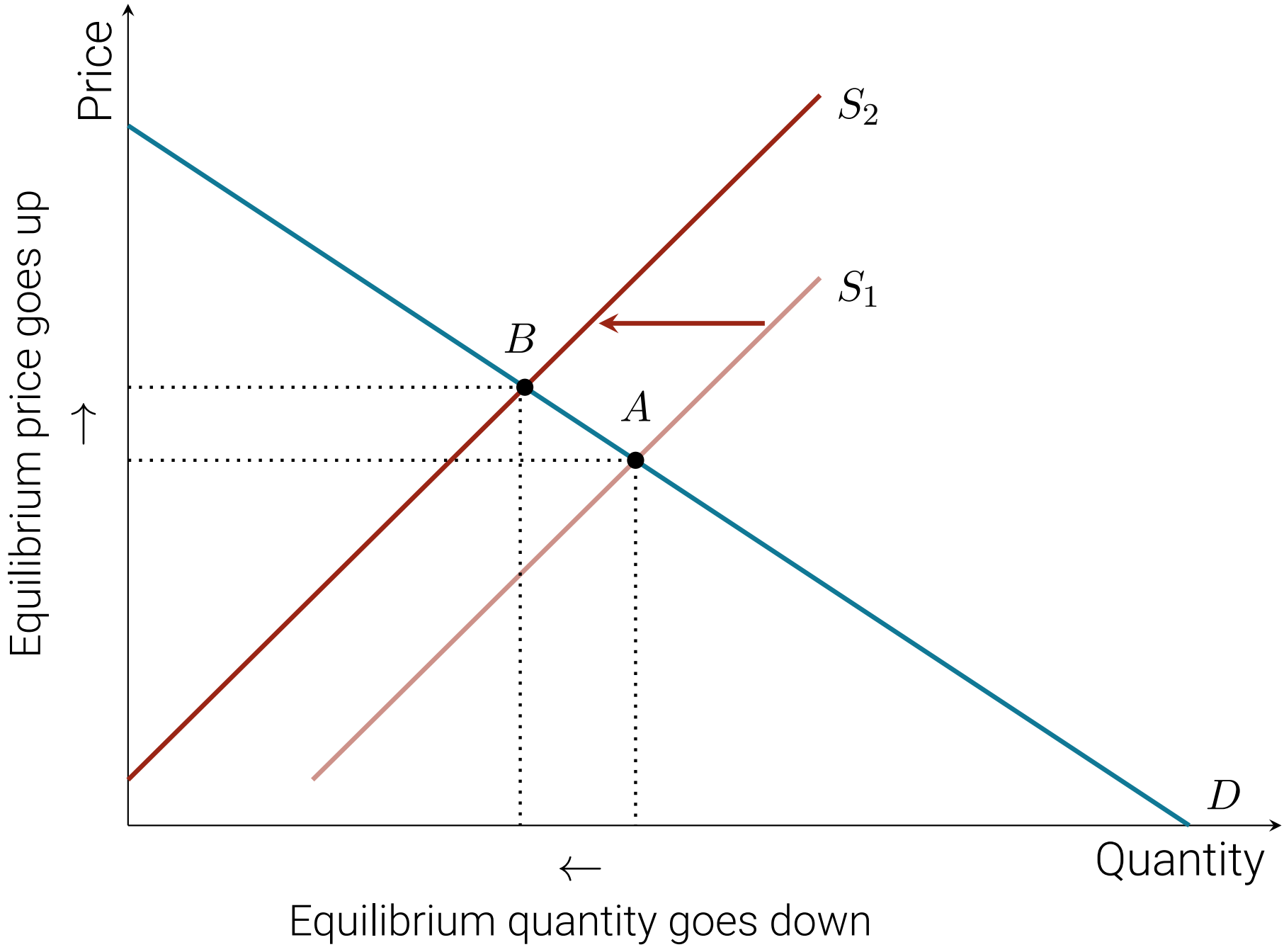
- This is really useful since it let's you decide whether or not to take an action by predicting how it affects variables you care about

Comparative statics analysis can be applied to constrained optimization or to equilibrium analysis.

Comparative Statics

Consider the market for pistachios:

- We can see what will happen to the price and quantity of pistachios in the market when the supply curve shifts.
- The shift in the supply curve represents an exogenous shock.


Price
Equilibrium price goes up
↑
S_2
S_1
B
A
D
Quantity
←
Equilibrium quantity goes down

Positive and Normative Analysis

Positive analysis attempts to explain how an economic system works or to predict how it will change over time.

- Explanatory questions, such as ”What has happened?”

Normative analysis asks prescriptive questions.

- Involves value judgments.

This class will focus on positive analysis.

Positive and Normative Analysis

Which of the following is a positive statement?

A) Rent controls (a rent ceiling) will cause a housing shortage.

B) It would be good for the U.S if we stop trading with China.

C) The minimum wage should be raised to make poor people better off.

D) Businesses need to pay their employees a living wage.